CLAIM AMENDMENTS

1. (currently amended) An apparatus for measuring a radius of a hole, comprising:
a support member having at least one non-articulated arm, each at least one arm having a first end and a second end, the first end rigidly attached to the support member;
a magnet moveably attached to the support member via the second end of each at least one arm;
a first magnetic sensor fixed to the support member for measuring a magnetic field of the magnet; ~~and~~
a second magnetic sensor fixed to the support member for measuring a magnetic field of the magnet; and
a third magnetic sensor fixed to the support, such that it is substantially unaffected by the magnetic field of the magnet in its direction of sensing, for measuring a magnetic field not produced by the magnet to distinguish the influence on the first or second sensor due solely to the magnetic field of the magnet.

2. (original) The apparatus of claim 1, wherein the first magnetic sensor is adapted to measure a component of the magnetic field.

3. (original) The apparatus of claim 1, wherein the first magnetic sensor is a magnetoresistive sensor.

4. (original) The apparatus of claim 1, wherein the magnet is a permanent magnet.

5. canceled

6. (currently amended) The apparatus of claim 1, wherein the first and second magnetic sensors are spaced apart at a known distance, and the second magnetic sensor is adapted to measure the component of the magnetic field measured by the first magnetic sensor.

7. (currently amended) The apparatus of claim 1, wherein the first and second magnetic sensors are ~~at a same location and the second magnetic~~ each dual function sensors adapted to measure ~~a magnetic field component that is~~ orthogonal ~~to the~~ components of the magnetic field of the magnet ~~measured by the first magnetic sensor~~.

8. (previously amended) The apparatus of claim 1, wherein the first magnetic sensor and the second magnetic sensor comprise magnetoresistive sensors.

9. canceled

10. (currently amended) The apparatus of claim 91, wherein the third magnetic sensor comprises a magnetoresistive sensor.

11. (currently amended) A downhole tool for measuring a radius of a borehole, comprising:
a housing having an exterior surface and an interior;
at least one non-articulated arm, each of the at least one arm having a first end and a second end, the first end rigidly attached to the exterior surface of the housing;
at least one permanent magnet moveably attached to the exterior surface of the housing and each at least one permanent magnet attached to the second end of each at least one non-articulated arm; ~~and~~
a first magnetic sensor, fixed in the interior of the housing for measuring a magnetic field of the at least one permanent magnet; and
a second magnetic sensor fixed within the housing, such that it is substantially unaffected by the magnetic field of the at least one permanent magnet in its direction of sensing, for measuring a magnetic field not produced by the at least one permanent magnet to distinguish the influence on the first sensor due solely to the magnetic field of the at least one permanent magnet.

12. (original) The downhole tool of claim 11, wherein the first magnetic sensor is adapted to measure a component of the magnetic field.

13. (original) The downhole tool of claim 11, wherein the first magnetic sensor comprises a magnetoresistive sensor.

14. canceled

15. (previously amended) The downhole tool of claim 11, wherein each of the at least one permanent magnet is in a protective enclosure.

16. (currently amended) The downhole tool of claim 11, further comprising a ~~second~~ third magnetic sensor, fixed in the interior of the housing for measuring the magnetic field of the at least one permanent magnet.

17. (currently amended) The downhole tool of claim 16, wherein the first and ~~second~~ third magnetic sensors are spaced apart at a known distance and the ~~second~~ third magnetic sensor is adapted to measure the component of the magnetic field measured by the first magnetic sensor.

18. (currently amended) The downhole tool of claim 16, wherein the first and ~~second~~ third magnetic sensors are ~~located at a same location and the second magnetic~~ each dual function sensors ~~is~~ adapted to measure ~~a magnetic field component that is~~ orthogonal ~~to~~

~~the~~ components of the magnetic field of the at least one permanent magnet ~~measured by the first magnetic sensor~~.

19. (currently amended) The downhole tool of claim 16, wherein the ~~second~~ third magnetic sensor comprises a magnetoresistive sensor.

20. canceled

21. (currently amended) The downhole tool of claim ~~20~~11, wherein the ~~third~~ second magnetic sensor comprises a magnetoresistive sensor.

22. (original) The downhole tool of claim 16, wherein the downhole tool is one selected from a logging-while-drilling tool, a measurement-while-drilling tool, and a wireline tool.

23. (currently amended) A method for measuring the radius of a subsurface borehole ~~displacement~~, comprising:

disposing a downhole tool within the borehole;

generating a magnetic field using a magnetic field source mounted on the downhole tool;

measuring a first magnitude of a component of the magnetic field using a first sensor mounted on the downhole tool and disposed within the magnetic field;

displacing the magnetic field source by moving the downhole tool along the borehole;

measuring a second magnitude of the component of the magnetic field using a second sensor mounted on the downhole tool and disposed within the magnetic field;

distinguishing the influence on the first or second sensor, due solely to the magnetic field source from the influence of a magnetic field not produced by said magnetic field source, using a third sensor mounted on the downhole tool; and

determining a distance that the magnetic field source is displaced using the first magnitude and the second magnitude.

24. (previously amended) The method according to claim 23, wherein the calculating the distance comprises using a function of magnitudes of the component of the magnetic field with respect to distances between the sensors and the magnetic field source.